

Remarks

Applicant would like to thank the Examiner for carefully reviewing the application. In the application claims 1-13 are pending. Claims 1 and 13 have been amended. No new matter has been added by this amendment.

Claims 1-5 and 9 were rejected under 35 U.S.C. §103(a) as being unpatenable over U.S. Patent No. 5,728,890 ("Zarnick") in view of U.S. Patent No. 6,078,671 ("Kawanishi"). Claims 1-13 are rejected under 35 U.S.C. §103(a) as being unpatentable over Zarnick in view of U.S. Patent No. 5,722,357 ("Choi"). Applicant respectfully traverses the rejections, but nevertheless amends the claims as indicated above. In view of the remarks below, and the amendments above, Applicant respectfully requests reconsideration of the application under 37 C.F.R. § 1.111 and allowance of the pending claims.

Before reviewing the claims in detail, Applicant believes it may be helpful to review some background. The present application relates to reducing noise that may be bothersome to vehicle passengers in the passenger compartment of vehicle traveling on the road. Specifically, the application relates to climate control systems in a vehicle, where ducts direct the flow of air to a passenger compartment of the vehicle. One example approach uses radial vanes in a duct that are located downstream of a fan, but upstream of a discontinuity, such as a bend. In this way, it is possible to reduce the turbulence of the flow around the bends or discontinuities, thereby reducing the noise.

A. Response to Arguments

In response to Applicant's previous arguments, the current Office Action states:

In regard to A.1: "The rejection fails to even cite any disclosure of, or motivation for, applying the building noise reduction techniques in a passenger compartment of a vehicle". A passenger compartment of a vehicle is an intended use of noise reduction in a duct. The vehicle itself has nothing to do with the noise generated in the duct. Duct noise reduction can be used in the building (5,728,980), vehicle (5,722,357), airplane, boat and train, etc. The second references in previous Office Action (Kawanishi et al. and Choi) are used to teach that the geometry of the vane can have different shapes to reduce the noise. In regard to A.2: "The rejection relies on a combination that leads to an incompatible system". Examiner disagrees because radial vanes can have different length in the other duct shapes. Circular duct is not part of the teaching.

While the Examiner may believe that "[t]he vehicle itself has nothing to do with the noise generated in the duct," Applicant respectfully submits that there is no evidence in the record to support such a belief. Rather, Applicant's specification states the opposite. Specifically, in the Background and Summary, the specification states on page 1:

The inventors herein have recognized a disadvantage with prior art noise reduction systems for climate control systems of passenger vehicles. Specifically, such system can have duct systems with significant amounts of bending or other discontinuities, so that the system can be packaged in to the vehicle. This is especially true with more modern vehicle designs where space outside the passenger compartment is at a premium. Air flowing around these bends, or through other discontinuities, can produce noise due to turbulent air flow caused by a blower fan. In one example, this noise can be due to impingement from turbulence on the discontinuities.

Further, the fact that noise reduction can be used in a building, vehicle, airplane, boat and train, etc. says nothing about the type, strength, style, mechanism and effectiveness of noise reduction in these different types of entities which can vary based on the requirements of each individual entity. The present application is directed to the particular problem of the reduction of noise generated by systems used for climate control of the passenger compartment in vehicles. Because of size and configuration constraints, passenger vehicles are faced with the delivery of a

Page 6 - AMENDMENT

Serial No. 10/683,600; Record ID 81044302

high ratio of air to duct volume with more discontinuities (bends, joints etc.) in the duct system.

None of the cited references recognize such issues.

B. Claim 1

The Office action again relies on a combination of Zarnick in view of Kawanishi et al. (or vice versa). However, Applicant respectfully submits that no matter which reference is used initially, there is no motivation to reach the claimed combination. This is illustrated in detail below.

B.1 Zarnick

Zarnick is directed towards duct systems in a building. A building is a large, fixed object that does not move. A vehicle is fundamentally different in that it is designed to move; i.e. it is a form of transportation. Applicant respectfully submits that a person of ordinary skill in the design of vehicle passenger compartment ventilation looking to solve the problem of excessive noise in the passenger compartment of a vehicle would not look to buildings. This is particularly true in the design of modern vehicles where the size of the passenger compartment has been increasing and the space remaining in the rest of the car for mechanical systems is at a premium.

This conclusion is further reinforced by the teaching of Zarnick, which states that "[t]his invention relates to a plastic covered duct silencer adapted for an enclosed building . . . [s]ometimes noise is carried from rooms or the heating plant in the air ducts to another room." (Zarnick, column 1, line 5-10). Zarnick is thus clearly describing a system for preventing noise originating in one room from being carried to another in an enclosed, stationary building. Zarnick therefore does not address the problems caused by excessive bending or other

discontinuities which may produce noise in a duct system. *I.e.*, Zarnick merely addresses noise carried from different rooms, not noise caused by the duct work itself.

There is no teaching or suggestion in Zarnick that the duct silencers could be used in a vehicle as required by claim 1. Additionally, there is no teaching or suggestion in Zarnick that the duct silencers could be used in ducts of a different shape, that the duct silencers by themselves are not completely effective, or that there is a problem with discontinuities in the duct work.

B.2 Kawanishi et al.

Figs 9 and 10 in Kawanishi show “a silencer 224 in accordance with an earlier technology which is substantially the same as that shown in Fig. 7, but which includes a plurality of rectangular blades or partitions 226.” (Column 1, lines 36-40) Kawanishi goes on to state that “such silencers involve problems in that the noise source or blower 204 generates vibrations which are transmitted through the duct wall.” (Column 1, lines 52-55) Kawanishi solves this problem by adding a noise detecting microphone, a loud speaker to deliver the sound collected by the microphone in a reverse phase, and a vibration shield. (Column 2, lines 4-17)

Applicant can find nothing in Kawanishi et al. dealing with passenger vehicles traveling on the road. Further, Applicant can find nothing in Kawanishi et al. suggesting that its radial vanes should be added to the building duct system of Zarnik. And finally, Applicant can find nothing in Kawanishi et al. indicating that the system can be used in a duct with bend, or that it would even be effective in a duct with bends. Therefore, even if Kawanishi were added to Zarnick (or vice versa), at best the combination would only teach a silencer with a microphone and loudspeaker which could be used in a stationary object such as a building.

B.3 Choi

Claim 1 requires that the duct is “directing a flow of air to a passenger compartment of the vehicle.” Choi is directed to engine noise created by an engine throttle in the intake system, not noise generated by air turbulence within ducts directing air to the passenger compartment. Claims 1 and 13 require the duct to connect to the passenger compartment of a vehicle. As the Office Action states, “the passenger compartment of a vehicle is [the] intended use of noise reduction in a duct.” Applicant respectfully submits that this limitation cannot simply be removed for the convenience of the prior art. When applying 35 U.S.C. §103, the following tenets of patent practice must be adhered to: “(A) The claimed invention must be considered as a whole; (B) The references must be considered as a whole and must suggest the desirability and thus the obviousness of making the combination; (C) the references must be viewed without the benefit of impermissible hindsight vision afforded by the claimed invention; and (D) reasonable expectation of success is the standard with which obviousness is determined.” (MPEP §2141) The claim, as a whole, requires that the ducts connect to the passenger compartment of a vehicle. Neither Choi nor Zarnick connect to the passenger compartment of a vehicle. They therefore do not suggest the desirability of making the combination. The only reason to combine the references would be through impermissible hindsight based on the problem taught by the present application and not the state of the art at the time the invention was made.

The Examiner is respectfully requested to withdraw this rejection.

C. Conclusion

Based on the foregoing comments, the above-identified application is believed to be in condition for allowance, and such allowance is courteously solicited. If any further amendment

Page 9 - AMENDMENT

Serial No. 10/683,600; Record ID 81044302

is necessary to advance prosecution and place this case in allowable condition, the Examiner is respectfully requested to contact the undersigned by fax or telephone at the number listed below.

Please charge any cost incurred in the filing of this Amendment, along with any other costs, to Deposit Account No.06-1510. If there are insufficient funds in this account, please charge the fees to Deposit Account No. 06-1505. A duplicate copy of this sheet is enclosed.

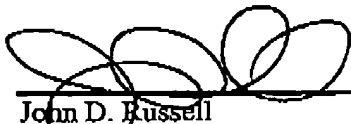
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